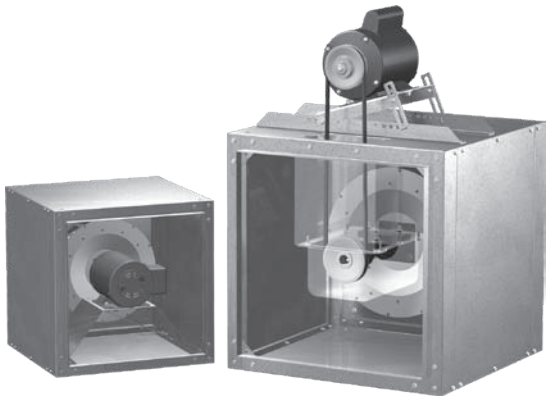
GREENHECK
Building Value in Air.

PN 472058
Models SQ and BSQ
Centrifugal Inline Fans

Installation, Operation and Maintenance Manual

Please read and save these instructions for future reference. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage!

Model SQ Direct Drive



Model SQ is a direct drive centrifugal inline exhaust fan. These fans are specifically designed for inline applications. Performance capabilities range up to 5,000 cfm *(8,500 m^3/hr)* and up to 2.0 in. wg *(498 Pa)* of static pressure. SQ fans are available in thirteen sizes with nominal wheel diameter ranging from 6 to 16 inches *(152 to 406 mm)* (060 - 160 unit sizes). Each fan shall bear a permanently affixed manufacture's engraved metal nameplate containing the model number and individual serial number.

Model BSQ Belt Drive

Model BSQ is a belt drive centrifugal inline exhaust fan. These fans are specifically designed for inline applications. Performance capabilities range up to 27,200 cfm *(46,200 m^3/hr)* and up to 4.0 in. wg *(996 Pa)* of static pressure. BSQ fans are available in fourteen sizes with nominal wheel diameter ranging from 7 to 42 inches *(178 to 1067 mm)* (070 - 420 unit sizes). Each fan shall bear a permanently affixed manufacture's engraved metal nameplate containing the model number and individual serial number.

General Safety Information

Only qualified personnel should install this fan. Personnel should have a clear understanding of these instructions and should be aware of general safety precautions. Improper installation can result in electric shock, possible injury due to coming in contact with moving parts, as well as other potential hazards. Other considerations may be required if seismic activity is present. If more information is needed, contact a licensed professional engineer before moving forward.

DANGER

Always disconnect, lock and tag power source before installing or servicing. Failure to disconnect power source can result in fire, shock or serious injury.

CAUTION

When servicing the fan, motor may be hot enough to cause pain or injury. Allow motor to cool before servicing.

CAUTION

Precaution should be taken in explosive atmospheres.

1. Follow all local electrical and safety codes, as well as the National Electrical Code (NEC) and the National Fire Protection Agency (NFPA), where applicable. Follow the Canadian Electric Code (CEC) in Canada.
2. The rotation of the wheel is critical. It must be free to rotate without striking or rubbing any stationary objects.
3. Motor must be securely and adequately grounded.
4. Do not spin fan wheel faster than max cataloged fan RPM. Adjustments to fan speed significantly effects motor load. If the fan RPM is changed, the motor current should be checked to make sure it is not exceeding the motor nameplate amps.
5. Do not allow the power cable to kink or come in contact with oil, grease, hot surfaces or chemicals. Replace cord immediately if damaged.
6. Verify that the power source is compatible with the equipment.
7. Never open access doors to a duct while the fan is running.

Receiving

Upon receiving the product check to make sure all items are accounted for by referencing the bill of lading to ensure all items were received. Inspect each crate for shipping damage before accepting delivery. Notify the carrier if any damage is noticed. The carrier will make notification on the delivery receipt acknowledging any damage to the product. All damage should be noted on all the copies of the bill of lading which is countersigned by the delivering carrier. A Carrier Inspection Report should be filled out by the carrier upon arrival and reported to the Traffic Department. If damaged upon arrival, file a claim with carrier. Any physical damage to the unit after acceptance is not the responsibility of Greenheck Fan Corporation.

Unpacking

Verify that all required parts and the correct quantity of each item have been received. If any items are missing, report shortages to your local representative to arrange for obtaining missing parts. Sometimes it is not possible that all items for the unit be shipped together due to availability of transportation and truck space. Confirmation of shipment(s) must be limited to only items on the bill of lading.

Handling

Move fan to desired location and determine position of access panels, discharge and motor. Make sure inlet and outlet have at least 2½ times the wheel diameter (duct diameter) before any obstructions like an elbow or transition. Attach the fan to a suitable framework as specified, (hanging or base vibration isolators are recommended). See chart 1 on page 3 for physical dimensions (Figures 1 and 2) and chart 3 on page 4 for dimensions of vibration isolator centerlines (Figures 5-7).

The motor's amperage and voltage ratings must be checked for compatibility to supply voltage prior to final electrical connection. Electrical lead in wires are then connected to the factory supplied safety disconnect switch. All wiring must conform to local and national codes.

Storage

Fans are protected against damage during shipment. If the unit cannot be installed and operated immediately, precautions need to be taken to prevent deterioration of the unit during storage. The user assumes responsibility of the fan and accessories while in storage. The manufacturer will not be responsible for damage during storage. These suggestions are provided solely as a convenience to the user.

Indoor

The ideal environment for the storage of fans and accessories is indoors, above grade, in a low humidity atmosphere which is sealed to prevent the entry of blowing dust, rain or snow. Temperatures should be evenly maintained between 30° to 110°F *(-1° to 43°C)* (wide temperature swings may cause condensation and "sweating" of metal parts). All accessories must be stored indoors in a clean, dry atmosphere.

Remove any accumulations of dirt, water, ice or snow and wipe dry before moving to indoor storage. To avoid "sweating" of metal parts allow cold parts to reach room temperature. To dry parts and packages use a portable electric heater to get rid of any moisture buildup. Leave coverings loose to permit air circulation and to allow for periodic inspection.

The unit should be stored at least 3½ in. *(89 mm)* off the floor on wooden blocks covered with moisture proof paper or polyethylene sheathing. Aisles between parts and along all walls should be provided to permit air circulation and space for inspection.

Outdoor

Fans designed for outdoor applications may be stored outdoors, if absolutely necessary. Roads or aisles for portable cranes and hauling equipment are needed. The fan should be placed on a level surface to prevent water from leaking into the fan. The fan should be elevated on an adequate number of wooden blocks so that it is above water and snow levels and has enough blocking to prevent it from settling into soft ground. Locate parts far enough apart to permit air circulation, sunlight and space for periodic inspection. To minimize water accumulation, place all fan parts on blocking supports so that rain water will run off.

Do not cover parts with plastic film or tarps as these cause condensation of moisture from the air passing through heating and cooling cycles.

Fan wheels should be blocked to prevent spinning caused by strong winds.

Inspection and Maintenance During Storage

While in storage, inspect fans once per month. Keep a record of inspection and maintenance performed.

If moisture or dirt accumulations are found on parts, the source should be located and eliminated. At each inspection, rotate the wheel by hand ten to fifteen revolutions to distribute lubricant on motor. If paint deterioration begins, consideration should be given to touch-up or repainting. Fans with special coatings may require special techniques for touch-up or repair. Machined parts coated with rust preventive should be restored to good condition promptly if signs of rust occur. Immediately remove the original rust preventive coating with petroleum solvent and clean with lint-free cloths. Polish any remaining rust from surface with crocus cloth or fine emery paper and oil. Do not destroy the continuity of the surfaces. Thoroughly wipe clean with Tectyl® 506 (Ashland Inc.) or the equivalent. For hard to reach internal surfaces or for occasional use, consider using Tectyl® 511M Rust Preventive, WD-40® or the equivalent.

Removing From Storage

As fans are removed from storage to be installed in their final location, they should be protected and maintained in a similar fashion until the fan equipment goes into operation.

Chart 1: SQ & BSQ Fan Dimensions

Model	A	B	C	*D	E	*F	*G	*H	Damper	SQ Weight^	BSQ Weight^
SQ 60-75	12 *(305)*	13 *(330)*	12 *(305)*	8⅞ *(225)*	1 *(25)*	-	-	-	9 *(229)*	26 *(12)*	-
SQ 80-95	15 *(381)*	16 *(406)*	15 *(381)*	11⅞ *(302)*	1 *(25)*	-	-	-	12 *(305)*	41 *(19)*	-
BSQ 70-80	15 *(381)*	21 *(533)*	15 *(381)*	11⅞ *(302)*	1 *(25)*	15½ *(394)*	14 *(356)*	12½ *(318)*	12 *(305)*	-	76 *(34)*
BSQ 90	15 *(381)*	21 *(533)*	15 *(381)*	11⅞ *(302)*	1 *(25)*	15½ *(394)*	14 *(356)*	12½ *(318)*	12 *(305)*	-	84 *(38)*
SQ-BSQ 100	17 *(432)*	21 *(533)*	17 *(432)*	13⅞ *(352)*	1 *(25)*	15½ *(394)*	14 *(356)*	12½ *(318)*	14 *(356)*	56 *(25)*	83 *(38)*
SQ-BSQ 120	19 *(483)*	21 *(533)*	19 *(483)*	15⅞ *(403)*	1 *(25)*	17⅞ *(454)*	16 *(406)*	12½ *(318)*	16 *(406)*	67 *(30)*	97 *(44)*
SQ-BSQ 130 (HP)	21 *(533)*	21 *(533)*	21 *(533)*	17⅞ *(454)*	1 *(25)*	17⅞ *(454)*	16 *(406)*	12½ *(318)*	18 *(457)*	67 *(35)*	97 *(44)*
SQ-BSQ 140 (HP)	23 *(584)*	22 *(559)*	23 *(584)*	19⅞ *(505)*	1 *(25)*	17⅞ *(454)*	16 *(406)*	12½ *(318)*	20 *(508)*	104 *(47)*	111 *(50)*
SQ-BSQ 160 (HP)	26 *(660)*	26 *(660)*	26 *(660)*	22⅞ *(581)*	1 *(25)*	20½ *(521)*	17 *(432)*	13⅞ *(340)*	23 *(584)*	160 *(73)*	208 *(94)*
BSQ 180 (HP)	28 *(711)*	28 *(711)*	28 *(711)*	23⅞ *(606)*	1½ *(38)*	24⅜ *(619)*	18 *(457)*	13¾ *(349)*	24 *(610)*	26 *(12)*	245 *(111)*
BSQ 200 (HP)	32 *(813)*	32 *(813)*	32 *(813)*	27⅞ *(708)*	1½ *(38)*	28 *(711)*	20 *(508)*	16 *(406)*	28 *(711)*	26 *(12)*	314 *(142*
BSQ 240 (HP)	39 *(991)*	34 *(864)*	39 *(991)*	34⅞ *(886)*	1½ *(38)*	32⅞ *(835)*	22 *(559)*	19 *(483)*	35 *(889)*	26 *(12)*	415 *(188)*
BSQ 300 (HP)	46 *(1168)*	38 *(965)*	46 *(1168)*	41⅞ *(1064)*	1½ *(38)*	34 *(864)*	22 *(559)*	18 *(457)*	42 *(1067)*	26 *(12)*	537 *(244)*
BSQ 360 (HP)	52 *(1321)*	42 *(1067)*	52 *(1321)*	47⅞ *(1216)*	1½ *(38)*	34 *(864)*	22 *(559)*	18 *(457)*	48 *(1219)*	26 *(12)*	686 *(311)*
BSQ 420 (HP)	58 *(1473)*	50 *(1270)*	58 *(1473)*	53⅞ *(1368)*	1½ *(38)*	34 *(864)*	22 *(559)*	18 *(457)*	54 *(1372)*	26 *(12)*	789 *(358)*

All dimensions in inches (millimeters) and weight is shown in pounds (kilograms). *May be greater depending on motor.
^Weight shown is largest cataloged Open Drip Proof motor.

Chart 2: Filter Option Dimensions

Model	A	B	C	D	WT.	Filter Size	Filter Quantity
SQ-60 - 75	22⅛ *(562)*	12 *(305)*	8⅞ *(225)*	1 *(25)*	40 *(18)*	10 x 12 *(254 x 305)*	1
SQ-80 - 95	45⅝ *(1159)*	15 *(381)*	11⅞ *(302)*	1 *(25)*	74 *(34)*	14 x 25 *(356 x 635)*	1
SQ-100	47¼ *(1200)*	17 *(432)*	13⅞ *(352)*	1 *(25)*	88 *(40)*	16 x 20 *(406 x 508)*	2
SQ-120	52³⁄₁₆ *(1326)*	19 *(483)*	15⅞ *(403)*	1 *(25)*	114 *(52)*	16 x 25 *(406 x 635)*	2
SQ-130	46⅜ *(1178)*	21 *(533)*	17⅞ *(454)*	1 *(25)*	120 *(54)*	20 x 20 *(508 x 508)*	2
SQ-140	52⅜ *(1330)*	23 *(584)*	19⅞ *(505)*	1 *(25)*	174 *(79)*	20 x 25 *(508 x 635)*	2
SQ-160	51⅜ *(1305)*	26 *(660)*	22⅞ *(581)*	1 *(25)*	246 *(112)*	20 x 20 *(508 x 508)*	4
BSQ-70 - 80 - 90	50⅝ *(1286)*	15 *(381)*	11⅞ *(302)*	1 *(25)*	117 *(53)*	14 x 25 *(356 x 635)*	1
BSQ-100	47¼ *(1200)*	17 *(432)*	13⅞ *(352)*	1 *(25)*	120 *(54)*	16 x 20 *(406 x 508)*	2
BSQ-120	52³⁄₁₆ *(1326)*	19 *(483)*	15⅞ *(403)*	1 *(25)*	144 *(79)*	16 x 25 *(406 x 635)*	2
BSQ-130 (HP)	46⅜ *(1178)*	21 *(533)*	17⅞ *(454)*	1 *(25)*	140 *(64)*	20 x 20 *(508 x 508)*	2
BSQ-140 (HP)	52⅜ *(1330)*	23 *(584)*	19⅞ *(505)*	1 *(25)*	181 *(82)*	20 x 25 *(508 x 635)*	2
BSQ-160 (HP)	51⅜ *(1305)*	26 *(660)*	22⅞ *(581)*	1 *(25)*	294 *(133)*	20 x 20 *(508 x 508)*	4
BSQ-180 (HP)	55¹⁄₁₆ *(1399)*	28 *(711)*	23⅞ *(606)*	1½ *(38)*	344 *(156)*	20 x 25 *(508 x 635)*	4
BSQ-200 (HP)	66¹¹⁄₁₆ *(1694)*	32 *(813)*	27⅞ *(708)*	1½ *(38)*	441 *(200)*	12 x 25 *(305 x 635)*	3
						16 x 25 *(406 x 635)*	3
BSQ-240 (HP)	68⅞ *(1749)*	39 *(991)*	34⅞ *(886)*	1½ *(38)*	573 *(260)*	20 x 25 *(508 x 635)*	4
						16 x 25 *(406 x 635)*	4
BSQ-300 (HP)	72⅛ *(1832)*	46 *(1168)*	41⅞ *(1064)*	1½ *(38)*	759 *(344)*	20 x 25 *(508 x 635)*	8
BSQ-360 (HP)	79¼ *(2013)*	52 *(1321)*	47⅞ *(1216)*	1½ *(38)*	957 *(434)*	16 x 25 *(406 x 635)*	10
						20 x 25 *(508 x 635)*	5
BSQ-420	93⅛ *(2365)*	58 *(1473)*	53⅞ *(1368)*	1½ *(38)*	1185 *(538)*	16 x 25 *(406 x 635)*	5
						20 x 25 *(508 x 635)*	10

Note: 24-inch side clearance is recommended for accessing and removing filters. All dimensions in inches (millimeters) and weight (WT.) in pounds (kilograms).

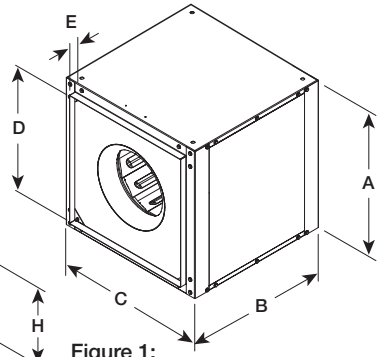


Figure 1:
SQ Dimensions

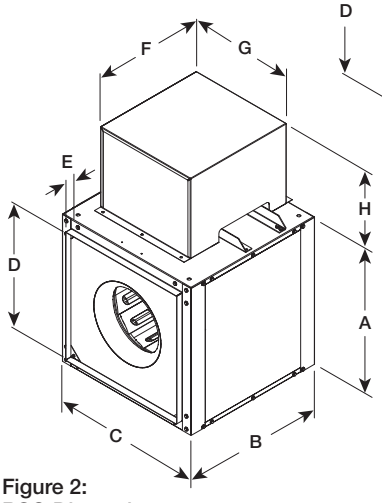


Figure 2:
BSQ Dimensions

Figure 3: Model SQ - Filter Options

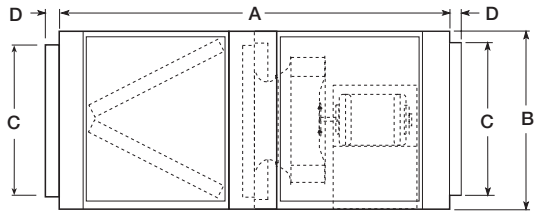


Figure 4: Model BSQ - Filter Options

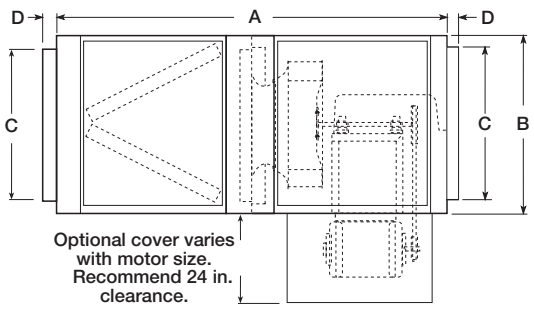


Chart 3: Vibration Isolator Dimensional Data														
Model	A	B	C	D	E	F	G	H	I	J	K	L	M	N
SQ 60-75	10⅝ *(270)*	17 *(432)*	15¾ *(400)*	8⅞ *(225)*	19¾ *(502)*	7 *(178)*	2 *(51)*	1⅜ *(35)*	5½ *(140)*	2 *(51)*	1⅜ *(35)*	2 *(51)*	6¾ *(171)*	2⅝ *(59)*
SQ 80-95	13¼ *(337)*	20 *(508)*	18¾ *(476)*	11⅞ *(302)*	43 *(1092)*	27⅜ *(695)*								
BSQ 70-90	18⅝ *(473)*	20⅛ *(511)*	18¾ *(476)*	11⅞ *(302)*	48⅝ *(1227)*	27⅜ *(695)*								
SQ-BSQ 100	18⅝ *(473)*	22⅛ *(562)*	20¾ *(527)*	13⅞ *(352)*	44⅞ *(1140)*	24 *(610)*								
SQ-BSQ 120	18⅝ *(473)*	24 *(610)*	22¾ *(578)*	16 *(406)*	49⅜ *(1254)*	28⅛ *(714)*								
SQ-BSQ 130 (HP)	18⅝ *(473)*	26⅛ *(664)*	24¾ *(629)*	17⅞ *(454)*	44 *(1118)*	23 *(584)*								
SQ-BSQ 140 (HP)	19⅝ *(498)*	28⅛ *(714)*	26¾ *(679)*	19⅞ *(505)*	50 1/16 *(1272)*	28 *(711)*								
SQ-BSQ 160 (HP)	23½ *(597)*	31 *(787)*	29¾ *(756)*	22⅞ *(581)*	49⅝ *(1260)*	23⅝ *(600)*	2 *(51)*	1⅜ *(35)*	5½ *(140)*	2 *(51)*	1⅜ *(35)*	2 *(51)*	6¾ *(171)*	2⅝ *(67)*
BSQ 180 (HP)	25½ *(648)*	33½ *(851)*	29 9/16 *(751)*	22¾ *(578)*	52 9/16 *(1335)*	24½ *(622)*								
BSQ 200 (HP)	29⅛ *(740)*	37 *(940)*	33¾ *(857)*	26¾ *(679)*	64 3/16 *(1630)*	32¼ *(819)*								
BSQ 240 (HP)	31⅝ *(803)*	44¼ *(1124)*	40¾ *(1035)*	33⅞ *(860)*	66½ *(1689)*	32⅛ *(816)*								
BSQ 300 (HP)	35 *(889)*	51 *(1295)*	47¾ *(1213)*	40⅞ *(1038)*	69⅛ *(1756)*	31⅜ *(797)*								
BSQ 360 (HP)	38¾ *(974)*	57¼ *(1454)*	53½ *(1359)*	46¾ *(1187)*	76 *(1930)*	34 11/16 *(881)*								
BSQ 420 (HP)	47⅛ *(1197)*	63 *(1600)*	59⅞ *(1521)*	59⅞ *(1521)*	90½ *(2299)*	40½ *(1029)*								

All dimensions in inches (millimeters).

Horizontal Hanging or Base Mount

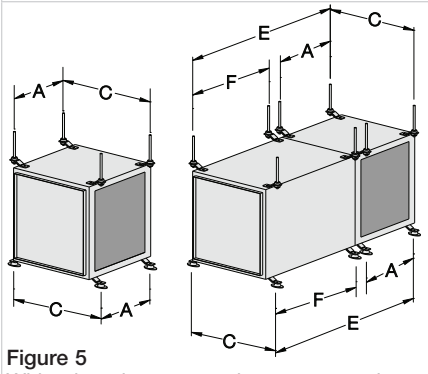


Figure 5
With a hanging mount, the motor may be located on either top or bottom. The base mount allows top motor location only. Both provide access panel on two sides.

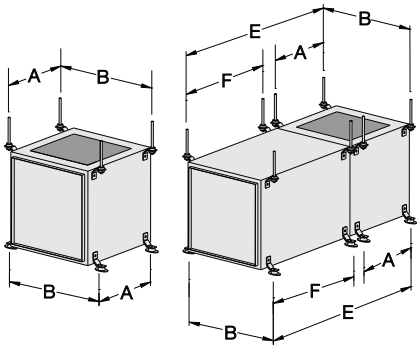


Figure 6
With either a hanging or base mount the motor may be located on either side. The base mount allows top access panels only.

Vertical Hanging or Base Mount

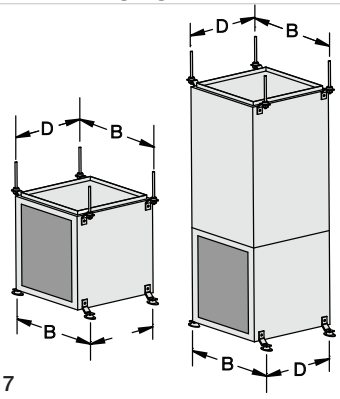
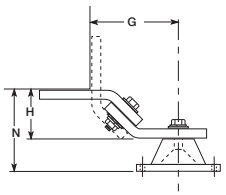


Figure 7
Mounting brackets are turned 90° for vertical mounting. Access panels are located on the two sides adjacent to mounting brackets.

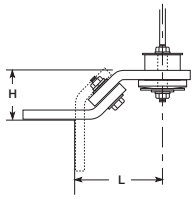
Standing Neoprene Isolator

Figure 8



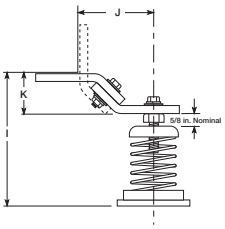
Hanging Neoprene Isolator

Figure 10



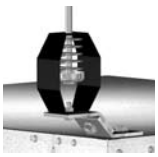
Standing Spring Isolator

Figure 9



Hanging Spring Isolator

Figure 11



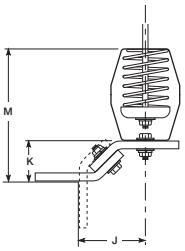


Chart 4: Side Discharge Duct Openings		
Unit Size	Width	Height
BSQ 70-80-90	11⅞ *(302)*	11⅞ *(302)*
SQ 60-75	9⅞ *(251)*	8⅞ *(225)*
SQ 80-95	12⅞ *(327)*	11⅞ *(302)*
SQ 100/BSQ 100	13⅞ *(352)*	13⅞ *(352)*
SQ120/BSQ 120	15⅞ *(403)*	15⅞ *(403)*
SQ 130/BSQ 130 (HP)	17⅞ *(454)*	17⅞ *(454)*
SQ 140/BSQ 140 (HP)	19⅞ *(505)*	19⅞ *(505)*
SQ 160/BSQ 160 (HP)	22⅞ *(581)*	22⅞ *(581)*
BSQ 180 (HP)	23⅞ *(606)*	23⅞ *(606)*
BSQ 200 (HP)	27⅞ *(708)*	27⅞ *(708)*
BSQ 240 (HP)	28⅞ *(733)*	34⅞ *(886)*
BSQ 300 (HP)	31⅞ *(810)*	41⅞ *(1064)*
BSQ 360 (HP)	32⅞ *(835)*	37⅞ *(962)*
BSQ 420	34⅞ *(886)*	43⅞ *(1114)*

All dimensions in inches (millimeters).

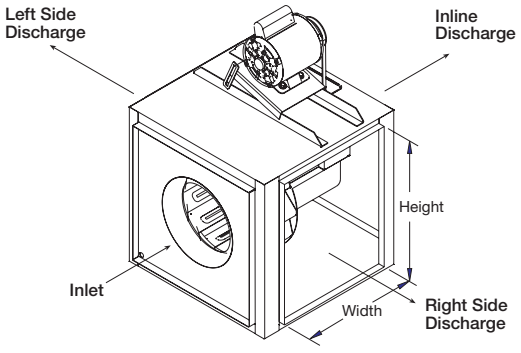


Figure 12

Duct Length: The inlet and outlet duct length should be approximately two to three wheel diameters long before and after the fan to achieve cataloged performance.

Side Discharge: Make sure discharge is orientated in the same direction as originally ordered, performance will change with different discharge positions. Refer to Figure 12 for proper side discharge definition and chart 4 for dimensions, page 4. Refer to the CAPS program or consult factory for performance corrections.

Pre Start-Up Checks

1. Check all fasteners for tightness. The wheel should rotate freely and be aligned as shown in Figure 13. Wheel position is preset and the unit is tested at the factory. Movement may occur during shipment, and realignment may be necessary. Centering can be accomplished by loosening the bolts holding the inlet (venturi) panel and repositioning. Wheel and inlet cone overlap can be adjusted by loosening the setscrews in the wheel and moving the wheel to the desired position.

Wheel Overlap Dimensions

Model	G - Overlap in. *(mm)*	H - Gap in. *(mm)*
SQ 60-95	-	1/8 *(3)*
SQ 100-160	1/4 *(6)*	-
BSQ 70-160	1/4 *(6)*	-
BSQ 180-240	3/8 *(10)*	-
BSQ 300-420	1/2 *(13)*	-

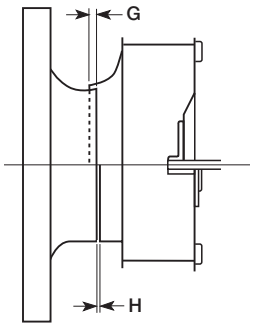


Figure 13

2. **Wheel Rotation:** Direction of wheel rotation is critical. Reversed rotation will result in poor air performance, motor overloading and possible burnout. Check wheel rotation by momentarily energizing the unit (all SQ and BSQ fans have clockwise wheel rotation when viewed from top of fan). Rotation should be clockwise as shown in Figure 14 and correspond to the rotation decal on the unit.

WARNING

Correct direction of wheel rotation is critical. Reversed rotation will result in poor air performance, motor overloading and possible burnout.

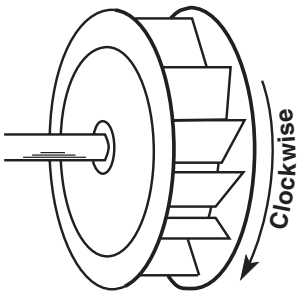


Figure 14

3. **Vibration Isolators:** After fan is moved to desired location, punch out the four knock-out holes which are located on the unit top and bottom panels. Assemble the brackets to the unit according to the appropriate drawings on page 4 and refer to respective parts list on page 11. Make certain all connectors are tight and that all washers are in.
4. **For BSQ Fans:** If adjustments are made, it is very important to check the pulleys for proper alignment. Misaligned pulleys lead to excessive belt wear, vibration, noise, and power loss. (see Figure 15).
5. **For BSQ Fans:** Belt tension can be adjusted by loosening four fasteners marked "R" on the drive frame. (refer to Figure 17 on page 6). The motor plate slides on the slotted adjusting arms. Belt tension should be adjusted to allow 1/64 inch of deflection per inch of belt span. For example, a 15 inch belt span should have 15/64 inch (or about 1/4 inch) of deflection with moderate thumb pressure at mid-point between pulleys (see Figure 16). Overtightening will cause excessive bearing wear and noise. Too little tension will cause slippage at start-up and uneven wear.

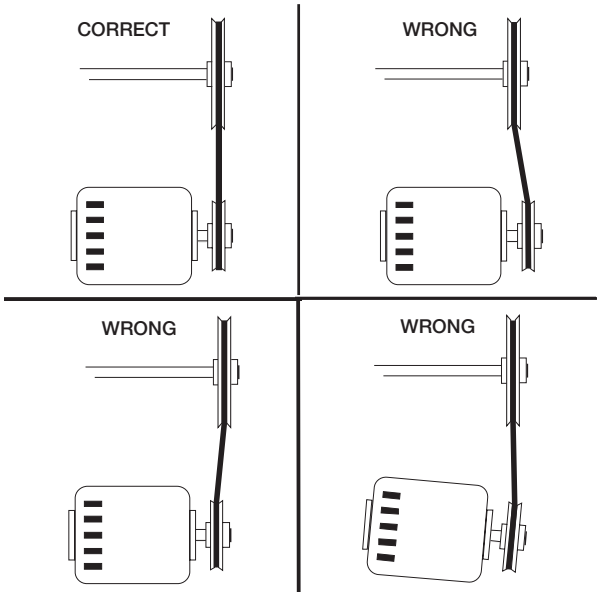


Figure 15

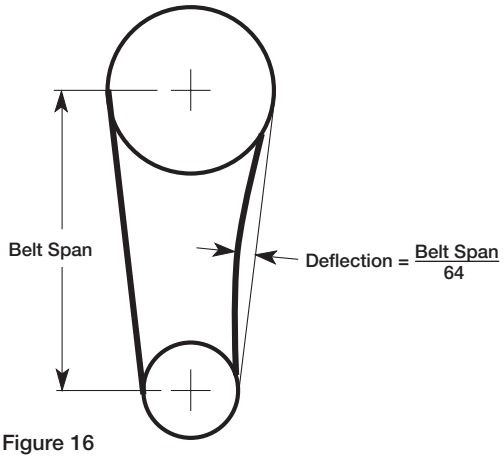
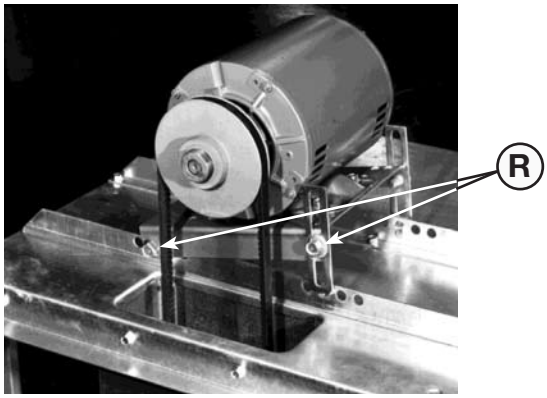


Figure 16



NOTE: Identical fasteners on opposing side must also be loosened.

Figure 17

6. The adjustable motor pulley is factory set for the RPM specified. Speed can be increased by closing or decreased by opening the adjustable motor sheave. Two groove variable pitch pulleys must be adjusted an equal number of turns open or closed. Any increase in speed represents a substantial increase in the horsepower required by a unit. Motor amperage should always be checked to avoid serious damage to the motor when speed is varied.

WARNING

The fan has been checked for mechanical noises at the factory prior to shipment. If mechanical noise should develop, suggested corrective actions are offered in the Troubleshooting section.

IMPORTANT

Over tightening will cause excessive bearing wear and noise. Too little tension will cause slippage at start-up and uneven wear.

IMPORTANT

Adjust (tighten) belt tension after the first 24-48 hours of operation.

Operation: SQ / BSQ

1. Before starting up or operating fan, check all fasteners for tightness. In particular, check the setscrews in wheel hub (and pulleys, if applicable).
2. While in the OFF position or before connecting the fan to power, turn the fan wheel by hand to be sure it is not striking the venturi or any obstacle.
3. Start the fan and shut it off immediately to check rotation of the wheel with directional arrow in the motor compartment, see Figure 14.
4. When the fan is started, observe the operation and check for any unusual noises.
5. With the system in full operation and all ductwork attached, measure current input to the motor and compare with the nameplate rating to determine if the motor is operating under safe load conditions.
6. Keep inlets and approaches to fan clean and free from obstruction.

Inspection: SQ / BSQ

Inspection of the fan should be conducted at the first 30 minute and 24 hour intervals of satisfactory operation.

30 Minute Interval

Inspect bolts, setscrews and motor mounting bolts. Adjust and tighten as necessary.

24 Hour Interval

Check all internal components. On BSQ unit only, inspect belt alignment and tension. Adjust and tighten as necessary.

Maintenance: SQ / BSQ

Installation and maintenance are to be performed only by qualified personnel who are familiar with local codes and regulations and who are experienced with this type of equipment.

Motor maintenance is generally limited to cleaning and lubrication (where applicable). Cleaning should be limited to exterior surfaces only. Removing dust buildup on motor housing ensures proper motor cooling.

Greasing of motors is only intended when fittings are provided. Many fractional horsepower motors are permanently lubricated and should not be lubricated after installation. Motors supplied with grease fittings should be greased in accordance with manufacturers' recommendations. Where motor temperatures do not exceed 104ºF *(40ºC)*, the grease should be replaced after 2,000 hours of running time as a general rule.

Wheels require very little attention when moving clean air. Occasionally, oil and dust may accumulate causing imbalance. When this occurs the wheel and housing should be cleaned to ensure smooth and safe operation.

All fasteners should be checked for tightness each time maintenance checks are performed prior to restarting unit.

A proper maintenance program will help these units deliver years of dependable service.

WARNING

Always disconnect, lock and tag power source before servicing. Failure to disconnect power source can result in fire, shock or serious injury.

CAUTION

Uneven cleaning of the wheel will produce an out of balance condition that will cause vibration in the fan.

WARNING

This unit should be made non-functional when cleaning the wheel or housing (fuses removed, disconnect locked off).

Belt/Bearing Maintenance BSQ Unit

1. Belts tend to stretch after a period of time. They should be checked periodically for wear and tightness. When replacing belts, use the same type as supplied with the unit.
2. Matched belts should always be used on units with multi-groove pulleys.
3. For belt replacement, loosen the tensioning device enough to allow removal of the belt by hand. Do not force belts on or off. This may cause cords to break, leading to premature belt failure.
4. Once installed, adjust belts as shown in "Pre-Starting Checks."
5. Shaft bearings can be classified in two groups: relubricating and non-relubricating. All bearings on standard Model BSQ fans are factory lubricated and require no further lubrication under normal use (between -20ºF and 180ºF in a relatively clean environment).
6. Units installed in hot, humid or dirty locations should be equipped with special bearings. These bearings will require frequent lubrication. Caution should be employed to prevent overpacking or contamination.
7. Grease fittings should be wiped clean. The unit should be in operation while lubricating. Extreme care should be used around moving parts.
8. Grease should be pumped in very slowly until a slight bead forms around the seal. A high grade lithium base grease should be used.

Recommended Relubrication Frequency in Months

NOTE: If unusual environment conditions exist (extreme temperature, moisture or contaminants) more frequent lubrication is required.

A good quality lithium base grease, conforming to NLGI Grade 2 consistency, such as those listed here may be used.

Table 2: Suggested Fan Bearing Greasing Intervals

Interval (months)	Type of Service
1 to 3	Heavy duty in dirty, dusty locations; high ambient temperatures; moisture laden atmosphere; vibration.
3 to 6	12 to 24 hours per day, heavy duty, or if moisture is present
6 to 12	8 to 16 hours per day in clean, relatively dry atmosphere
12 to 18	Infrequent operation or light duty in clean atmosphere

Table 3: Grease Manufacturers

Manufacturer	Grease (NLGI #2)
U.S. Electric Motors	Grease No. 83343
Chevron U.S.A. Inc	Chevron SRI Grease #2
Mobil Oil Corporation	Mobilith
	Mobil 532
Texaco, Inc.	Premium BRB #2
	Texaco Multifak #2
Amoco Oil Co.	Rykon Premium #2
Exxon	Unirex N2
Shell	B Shell Alvania #2

Maintenance Documentation

Job Information

Job Name:_____
Address: _____
City: _____
State: _____ Zip:_____
Phone: _____
Contact Person:_____

Service Organization: _____
Address:_____
City:_____
State: _____ Zip: _____
Phone: _____
Work Done By: _____

Nameplate Information

Model: _____
Volts: _____ Hertz:_____ Phase:_____
Amps:_____ Mark: _____
Supply hp:_____ Exhaust hp: _____
Serial Number: _____
Model Voltage:_____
Motor Amperage: _____
Fan RPM: _____

Field Start-Up Documentation

Actual Voltage: _____ Hertz: _____ Phase:_____
Actual Amperage: _____
Blower Rotation: _____
Air Volume: Design cfm: _____
Actual cfm:_____
Level of fan (L or H): _____
Fan RPM Range (min.) _____ (max.) _____

Maintenance Log

Date	Time	Notes

Troubleshooting

WARNING: Before taking any corrective action, make certain unit is not capable of operation during repairs.

PROBLEM	CAUSE	CORRECTIVE ACTION
Excessive noise or vibration	Wheel unbalance	Clean all dirt off wheel. Check wheel balance, rebalance in place if necessary.
	Bad bearings	Replace.
	Belts too tight or too loose	Adjust tension, see Figure 16.
	Wheel improperly aligned and rubbing	Center wheel on inlet, see Figure 13.
	Loose drive or motor pulleys	Align and tighten. See “Pre-Starting Checks”, see page 5-6.
	Foreign objects in wheel or housing	Remove objects, check for damage or unbalance.
Reduced airflow	System resistance too high	Check system: Proper operation of backdraft or control dampers, obstruction in ductwork, clean dirty filters.
	Unit running backwards	Correct as shown in Figure 14.
	Excessive dirt buildup on wheels	Clean wheel.
	Improper wheel alignment	Center wheel on inlets, see Pre-Starting checks and Figure 13.

Parts List

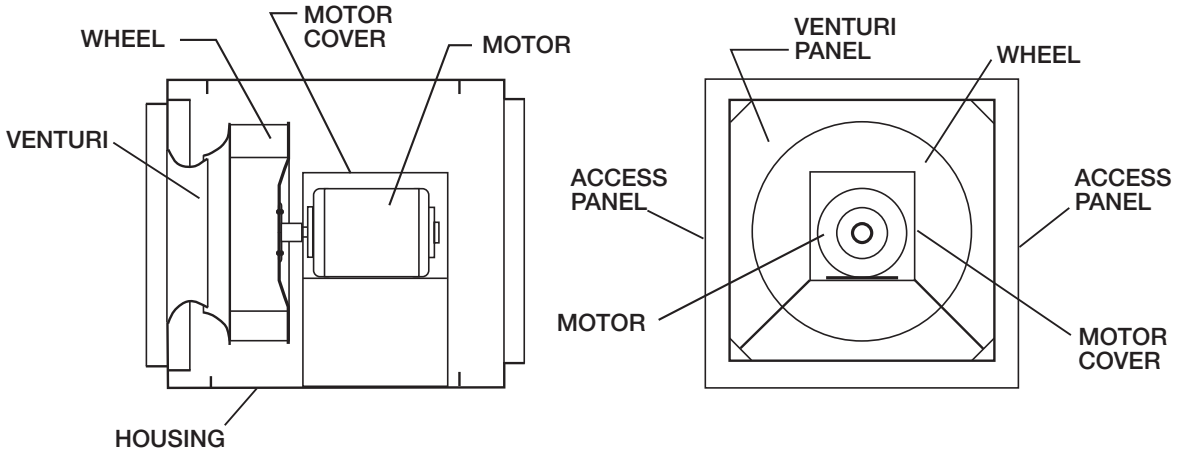
NOTE

Each fan bears a manufacturer's nameplate with model number and serial number embossed. This information will assist the local Greenheck representative and the factory in providing service and replacement parts. Before taking any corrective action, make certain unit is not capable of operation during repairs.

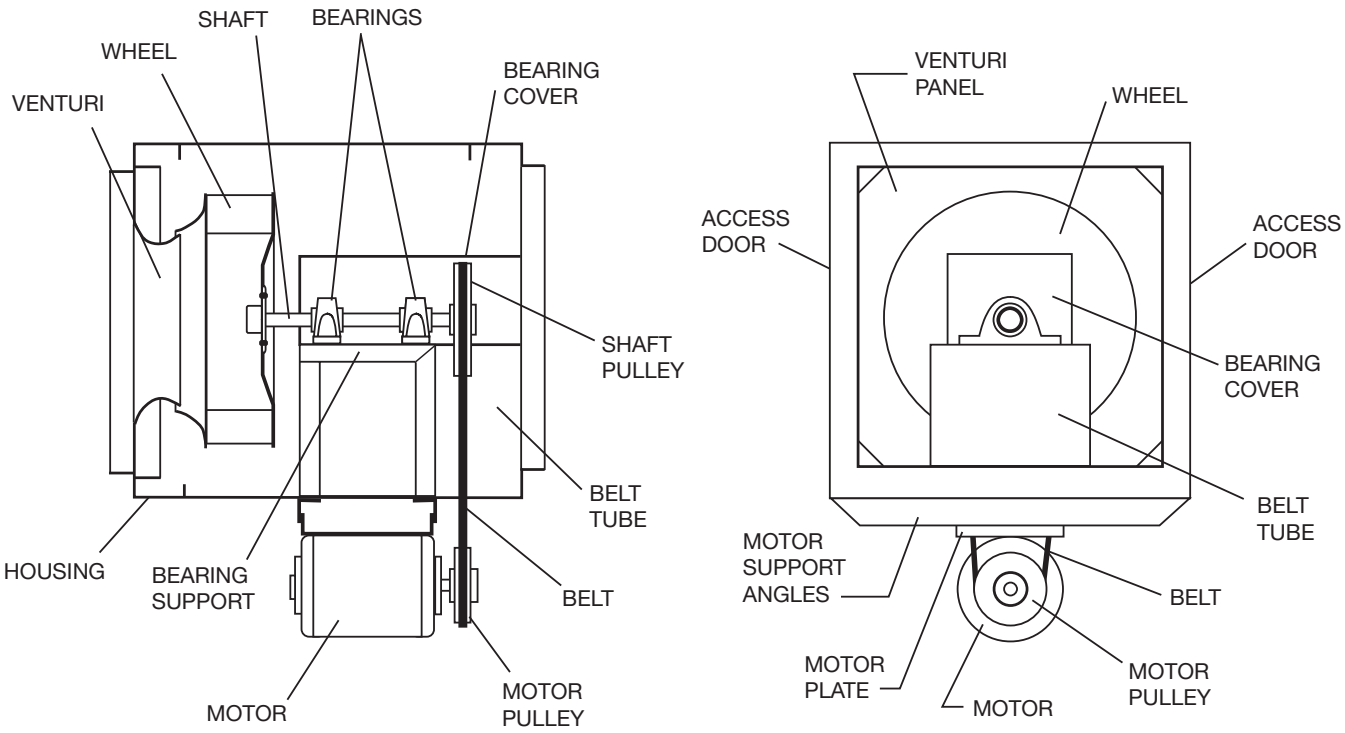
CAUTION

A fan manufactured with an explosion resistant motor does not certify the entire unit to be explosion proof. Refer to UL Listing Mark for the fans approved usage.

SQ Direct Drive Centrifugal Inline Exhaust Fan

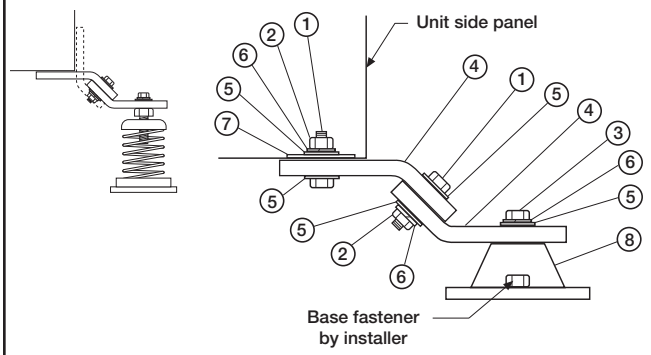


BSQ Belt Drive Centrifugal Inline Exhaust Fan

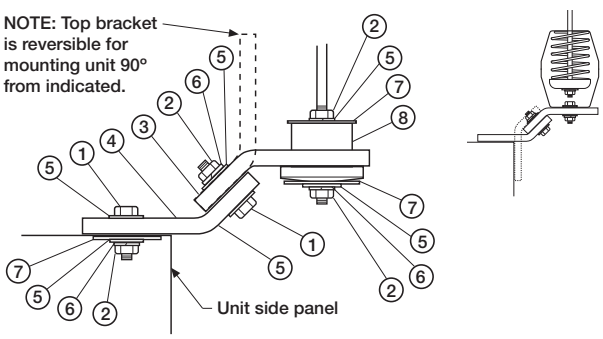


Isolator Parts List

STANDING SUPPORT ISOLATOR



HANGING SUPPORT ISOLATOR



No.	Qty.	Description	SQ-60 thru 140 BSQ-100 thru 140	SQ-160 BSQ-160 thru 420
1	8	Cadium plated hex head bolts	3/8 in. - 16 x 1 in.	3/8 in.-16 x 1 1/4 in.
2	8	Cadium plated hex nuts	3/8 in. - 16	3/8 in. - 16
3	4	Cadium plated hex head bolts	5/16 in. - 18 x 1 in.	3/8 in. - 16 x 1 in.
4	8	Std. mount bracket with (2) 7/16 in. holes	3/16 in.	1/4 in.
5	20	Cadium plated washer	7/8 in. O.D. x 3/8 in. I.D. x 1/16 in.	7/8 in. O.D. x 3/8 in. I.D. x 1/16 in.
6	12	Cadium plated lock washer	3/8 in.	3/8 in.
7	4	Cadium plated washer	1 3/8 in. O.D. x 9/16 in. I.D. x 3/32 in.	1 3/8 in. O.D. x 9/16 in. I.D. x 3/32 in.
8	4	Neoprene or Spring Isolator	Reference appropriate table below for replacement Isolator(s)	

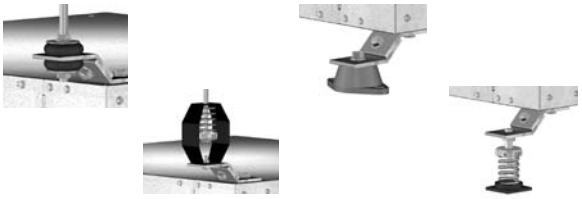
No.	Qty.	Description	SQ-60 thru 140 BSQ-100 thru 140	SQ-160 BSQ-160 thru 420
1	8	Cadium plated hex head bolts	3/8 in. - 16 x 1 in.	3/8 in.-16 x 1 1/4 in.
2	16	Cadium plated hex nuts	3/8 in. - 16	3/8 in. - 16
3	4	Std. mount bracket with (1) 1/4 in. hole	3/16 in.	1/4 in.
4	4	Std. mount bracket with (2) 7/16 in. holes	3/16 in.	1/4 in.
5	24	Cadium plated washer	7/8 in. O.D. x 3/8 in. I.D. x 1/16 in.	7/8 in. O.D. x 3/8 in. I.D. x 1/16 in.
6	12	Cadium plated lock washer	3/8 in.	3/8 in.
7	12	Cadium plated washer	1 3/8 in. O.D. x 9/16 in. I.D. x 3/32 in.	1 3/8 in. O.D. x 9/16 in. I.D. x 3/32 in.
8	4	Neoprene or Spring Isolator	Reference appropriate table below for replacement Isolator(s)	

REPLACEMENT SPRING ISOLATOR(S)

MODEL	FAN SIZES					
BSQ	----	70-130	140-180	200	240-300	360-420
SQ	60-100	120-140	160	----	----	----
BASE MOUNT	FDS-1-35 BLUE	FDS-1-70 GREEN	FDS 1-120 GRAY	FDS 1-120 GRAY	FDS-1-220 BROWN	FDS-1-370 ORANGE
HANGING	SH-1-35 BLUE	SH-1-70 GREEN	SH-1-125 GRAY	SH-1-245 BROWN	SH-1-245 BROWN	SH-1-370 ORANGE

REPLACEMENT NEOPRENE ISOLATOR(S)

MODEL	FAN SIZE		
BSQ	70-140	160-200	240-420
SQ	60-140	160	----
BASE MOUNT	R-1 GREEN	R-2 BLACK	R-2 RED
HANGING	40DUR BLACK	50DUR BLACK	50DUR BLACK



Warranty

Greenheck warrants this equipment to be free from defects in material and workmanship for a period of one year from the purchase date. Any units or parts which prove defective during the warranty period will be replaced at our option when returned to our factory, transportation prepaid. Motors are warranted by the motor manufacturer for a period of one year. Should motors furnished by Greenheck prove defective during this period, they should be returned to the nearest authorized motor service station. Greenheck will not be responsible for any removal or installation costs.

As a result of our commitment to continuous improvement, Greenheck reserves the right to change specifications without notice.

Greenheck Centrifugal Inline Fans Catalog, Models SQ/BSQ provides additional information describing the equipment, fan performance, available accessories, and specification data.

AMCA Publication 410-96, Safety Practices for Users and Installers of Industrial and Commercial Fans, provides additional safety information. This publication can be obtained from AMCA International, Inc. at: www.amca.org.

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Building Value in Air.

Phone: (715) 359-6171 • Fax: (715) 355-2399 • E-mail: gfcinfo@greenheck.com • Website: www.greenheck.com

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